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| 10/646,844 | 08/25/2003 | Yi-Liang Lu | 3079/186 | 1458 |

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EXAMINER

SHERMAN, STEPHEN G

ART UNIT PAPER NUMBER

2674

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Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/646,844 | LU ET AL. | |
| | Examiner | Art Unit | |
| | Stephen G. Sherman | 2674 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 recites the limitation "the signal preprocessor." There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1 and 6 are rejected under 35 U.S.C. 102(a) as being anticipated by AAPA (Figures 1 and 2, and Page 1, line 12 to page 4, line 14 of the specification).

Regarding claim 1, AAPA discloses a liquid crystal display (LCD) device (Figure 1), comprising: a gray signal modulator for receiving gray signals of the input image data (Figure 1, item 10), and for outputting modified gray signals by considering the current and the preceding field image data (Page 3, lines 13-16), or by considering the

character of input image data; a data driver (Figure 1, item 12) for converting the modified gray signals into the corresponding data voltages for driving the liquid crystal molecules in each to produce image signal (Page 2, lines 19-20); a gate driver (Figure 1, item 13) for continuously supplying the scanning signals (Page 2, lines 20-21), and a liquid crystal display panel (Figure 1, item 14), comprising a plurality of gate lines (Figure 1, item 15) for transmitting said scanning signals, a plurality of data lines (Figure 1, item 16) being insulated from and crossing the gate lines for transmitting image signals, and an array of pixels forming by the areas surrounded by the said gate lines and said data lines (Page 2, lines 21-24).

Regarding claim 6, AAPA discloses a method for driving a LCD device, comprising inputting gray signals of input image data into a gray signal modulator (Figure 1, item 10); modifying the input gray signals into modified gray signals by the gray signal modulator (Figure 2 and page 2, line 17-18); outputting the modified gray signals to a data driver (Figure 1); converting the modified gray signals into corresponding image data voltages by the data driver (Page 2, lines 19-20), and driving each pixel of the LCD device by the image data voltages, thereby achieving the desired brightness in each pixel of the LCD device (Page 3, lines 4-6).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA

(Figures 1 and 2, and Page 1, line 12 to page 4, line 14 of the specification) in view of

Someya et al (US 6,756,955).

Regarding claim 3, AAPA discloses the LCD device as described in claim 1, wherein the gray signal modulator (Figure 2) comprises: an input terminal for receiving the gray signals of input image data (Figure 2, item 20); a frame memory for storing the preceding field image data of the input gray signals (Figure 2, item 21); a controller for controlling the frame memory and the reading and writing processes thereof (Figure 2, item 22); a gray signal data converter for outputting the modified gray signals by considering the gray signals of the preceding field image data transmitted from the frame memory and the input (Figure 2, item 23), and an output terminal for transmitting the modified gray signal to the data driver (Figure 2, item 24). AAPA fails to teach of a gray signal modulator comprising a signal preprocessor for preprocessing the gray

signal from the input terminal or detecting the character thereof. Someya et al. disclose a noise rejection unit for preprocessing signals from an input terminal or detecting the character thereof (Figure 62, item 43 and Column 25, lines 32-41). Therefore it would have been obvious to "one of ordinary skill" in the art to insert the noise rejection unit of Someya et al. into the gray signal modulator disclosed by AAPA in order to remove a noise component before encoding to reduce error and thus making it possible to control the response speed of the liquid crystal more accurately.

8. Claims 7 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA (Figures 1 and 2, and Page 1, line 12 to page 4, line 14 of the specification) in view of Botsford, III et al. (US 5,734,419).

Regarding claim 7, AAPA discloses the method for driving a LCD device as described in claim 6. AAPA also discloses wherein the method for modulating the input gray signals by the gray signal modulator is achieved by considering the current and the preceding field image data thereby outputting the suitable modified gray signals (Page 3, lines 13-16). AAPA fails to teach of considering the character of input signals. Botsford, III et al. disclose of considering the character of input signals (Column 3, lines 41-50. The examiner interprets that the look-up table module contained in the preprocessor would consider the character of the input since it could be used to perform gamma correction, pedestal adjustment, contrast enhancement, and the like). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of AAPA and Botsford, III et al. in order to allow for the indication of a change

which would allow for the reschedule or alignment of the next frame thus improving encoded image quality.

Regarding claim 11, AAPA and Botsford, III et al. disclose the method for driving a LCD device as described in claim 7. Botsford, III et al. also disclose wherein the method for modifying the input signals by an encoder further comprises a signal preprocessor (Column 3, lines 17-33) for detecting a certain character of the input signals (Column 3, lines 41-50. The examiner interprets that the look-up table module contained in the preprocessor would detect certain characters since it could be used to perform gamma correction, pedestal adjustment, contrast enhancement, and the like) and then sending a flag that represents said character to a rate controller for providing different signal schemes (Column 5, lines 16-20).

Regarding claim 12, AAPA and Botsford, III et al. disclose the method for driving a LCD device as described in claim 11. Botsford, III et al. also disclose wherein said character of input signals detected by an encoder includes different parameters (Column 3, lines 41-50. The examiner interprets that the look-up table module contained in the preprocessor would detect different parameters since it could be used to perform gamma correction, pedestal adjustment, contrast enhancement, and the like, and that these parameters could be different video systems, different frame rates, different images with different signal-to-noise ratios, different interfaces or user dependent parameters.).

Regarding claim 13, AAPA and Botsford, III et al. disclose the method for driving a LCD device as described in claim 11. Botsford, III et al. also disclose wherein said

different signal schemes can be achieved by using multiple look-up tables (Column 3, lines 41-50).

9. Claims 4-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA (Figures 1 and 2, and Page 1, line 12 to page 4, line 14 of the specification) and Someya et al (US 6,756,955) in view of Botsford, II et al. (US 5,734,419).

Regarding claim 4, AAPA and Someya et al. disclose the gray signal modulator as described in claim 3. AAPA and Someya et al. fail to teach of a gray signal modulator wherein the signal preprocessor is specifically designed for detecting a certain character of input gray signal for providing the gray signal data converter to select a suitable converting scheme. Botsford, III et al. disclose of a preprocessor specifically designed for detecting a certain character of input signal for providing a rate controller to select a suitable scheme (Figure 1, item 12 and Column 3, lines 17-33. The examiner interprets that this certain character would be the redundant fields.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings Botsford, III et al. with the gray signal modulator taught by AAPA and Someya et al. in order to reschedule or align the next frame thus improving encoded image quality.

Regarding claim 5, AAPA, Someya et al. and Botsford, III et al. disclose the signal preprocessor as described in claim 4. Botsford, III et al. also disclose wherein the detection of said character of input gray signal data includes the detection of

different parameters (Column 3, lines 41-50. The examiner interprets that the look-up table module contained in the preprocessor would detect different parameters since it could be used to perform gamma correction, pedestal adjustment, contrast enhancement, and the like, and that these parameters could be different video systems, different frame rates, different images with different signal-to-noise ratios, different interfaces or user dependent parameters.).

Regarding claim 8, AAPA and Botsford, III et al. disclose the method for driving a LCD device as described in claim 7. AAPA and Botsford, III et al. fail to teach of a method for modifying the input gray scale signals by the gray signal modulator further comprises a signal preprocessor, which is specifically designed as a noise-reduction preprocessor for reducing the noise of input gray signals. Someya et al. also disclose wherein a method for modifying the input signals by an image data processor further comprises a noise reduction unit, which is specifically designed as a noise-reduction preprocessor for reducing the noise of input signals (Figure 62, item 43 and column 25, lines 32-41). Therefore it would have been obvious to "one of ordinary " skill in the art to combine the teachings of AAPA, Botsford, III et al. and Someya et al. in order to remove a noise component before processing image data to reduce error and thus making it possible to control the response speed of the liquid crystal more accurately.

10. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA (Figures 1 and 2, and Page 1, line 12 to page 4, line 14 of the specification),

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Someya et al (US 6,756,955) and Botsford, II et al. (US 5,734,419) in view of Gupta et al. (US 5,852,475)

Regarding claim 9, AAPA, Someya et al. and Botsford, III et al. disclose the method for driving a LCD device as described in claim 8. AAPA, Someya et al. and Botsford, III et al. fail to teach of a method wherein the noise reduction is achieved by considering the difference between the current and the preceding field image data, wherefrom the input gray signal is considered as signal and is outputted directly if the difference exceeds a presetting noise threshold, otherwise the input gray signal is considered as noise and is outputted after noise reduction modification. Gupta et al. disclose of a method wherein the noise reduction is achieved by considering the difference between the current and the preceding field image data, wherefrom the input gray signal is considered as signal and is outputted directly if the difference exceeds a presetting noise threshold, otherwise the input gray signal is considered as noise and is outputted after noise reduction modification (Column 7, lines 21-49. The examiner interprets that the value stated as sixteen would be considered the noise threshold.). Therefore it would have been obvious to "one of ordinary skill" in the art to combine the teachings of AAPA, Someya et al., Botsford, III et al. and Gupta et al. in order to provide for an even better reduction in blocking artifacts and mosquito noise.

Regarding claim 10, AAPA, Someya et al., Botsford, III et al. and Gupta et al. disclose the method for driving a LCD device as described in claim 9. Gupta et al. also disclose wherein the method for noise reduction further satisfies

$$F_n' = F_n \text{ if } |F_n - F_{n-1}| \geq N_{th},$$

$$F_n' = F_{n-1} + a(F_n - F_{n-1}), \text{ if } |F_n - F_{n-1}| < N_{th};$$

wherein F_n is the current field image data, F_{n-1} is the preceding field image data, F_n' is the modified current field image data, N_{th} is a presetting noise threshold, and a is a presetting parameter (Column 7, lines 21-49. The examiner interprets that $Q_n = F_n'$, $F_{n-1} = F_{n-1}$ and $P_n = F_n$. Also the examiner interprets that the value sixteen would be the preset noise threshold. As for the presetting parameter a , the examiner interprets that since when the digital pixel difference is greater than or equal to sixteen that the current pixel is outputted and that when the digital pixel difference is less than sixteen the value is modified, that the modification would be of some value between zero and one such that the value is reduced.).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

26 October 2005


REGINA LIANG
PRIMARY EXAMINER